our planet

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JUAN RAFAEL ELVIRA QUESADA

JEAN-LOUIS BORLOO

HRH PRINCE EL HASSAN BIN TALAL
SOLAR REVOLUTION

FERNANDO HADDAD
LEARNING FOR LIFE

YOUR PLANET NEEDS YOU

practical action

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DIPAL CHANDRA BARUA : Green Light PAGE 24
shows how affordable renewable energy is bringing power and employment to poor rural people.

LI YAN : Low-carbon China PAGE 28
describes what her country is doing to combat climate change, and calls for urgent action to build a green economy.

SHAI AGASSI : Driving away oil addiction PAGE 30
explains how environmental and economic interests are being realigned to make a revolutionary system of electric cars a reality.

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books

The Natural Fix? The role of ecosystems in climate mitigation

The rapid response assessment on biosequestration provides a synthesis of the current state of knowledge regarding the role of biological systems, including natural ecosystems, agri-ecosystems, and bio-engineered systems, in sequestering carbon. Potential policies to increase biosequestration are examined taking into consideration the social, economic and environmental aspects involved, as well as potential trade-offs. The assessment also looks at the impacts of climate change on the capacity of systems to absorb carbon.

The Environmental Food Crisis: The Environment's Role in Averting Future Food Crises

A new rapid response assessment report released by UNEP cautions that unless action is taken, nearly twenty-five percent of the world's food production may be lost due to environmental degradation by 2050. Prepared by the Rapid Response Assessment Team at UNEP/GRID-Arendal and UNEP-WCMC, the report provides the first summary by the UN of how climate change, water stress, invasive pests and land degradation may impact world food security, food prices and life on the planet and how we may be able to feed the world in a more sustainable manner. The report calls for intelligent and creative approaches to recycling food wastes and fish discards.

World Water Development Report 3: Bridging Divides for Water
(Earthscan, 2008)

The United Nations World Water Development report, launched at the 5th World Water Forum in Istanbul in March 2009, shows that urgent action is needed if we are to avoid a global water crisis. Written and coordinated by the 26 UN agencies and entities which make up UN-Water, the report provides a comprehensive analysis of the state of the world's freshwater resources. It also, for the first time, shows how changes in water demand and supply are affected by and affect other global dynamics.

Careers in Renewable Energy: Get a Green Energy Job
Gregory McNamee (Prox Jack Press, 2008)

This book contains a wealth of information and resources for anyone searching for a job in the fast-growing field of renewable energy. Readers can discover how green energy can be a part of their professional future. It highlights a slew of job sectors including solar and wind energy, biofuels, hydrogen energy and fuel cells, geothermal energy, hydro energy, green building, climate study, energy management and efficiency, and much more.

A Roadmap for a Secure, Low-Carbon Economy: Balancing Energy Security and Climate Change
Sarah Landislaw, Kathryn Zyla, Jonathan Pershing, Frank Verrastro, Jenna Goodward, David Pumphrey, Britt Childs Staley (World Resources Institute, 2009)

This report, released by the Center for Strategic & International Studies (CSIS) Energy and National Security Program and the World Resources Institute, identifies a set of policies to address energy security and climate change simultaneously. Furthermore, the roadmap creates a three-part framework for thinking about the transition to a secure, low-carbon economy.

Gorillas: The Gentle Giants
Martin Harvey, Letitia Farris-Toussaint (Evans Mitchell Publications, 2009)

This 132 page book features a combination of informative text and striking images designed to take us through the history, features and habits of gorillas. The reader gets a sense of the fascinating creatures' family life, their environments and the problems they face in the future. The author, Letitia Farris-Toussaint, discusses gorillas' fight for survival as they are faced with problems of poaching, disease, deforestation, and the effect of armed conflict. The fact that these majestic creatures are one of man's closest relatives (second only to Chimpanzees) becomes abundantly clear by looking at their expressions and gestures caught in Martin Harvey's photographs. The launch of this book supported the survival of gorilla populations and marked the Year of the Gorilla (YoG) 2009.

Biofuels and Rural Poverty
Joy Clancy, Jon Lovett (Earthscan, 2009)

The role of biofuels in poverty reduction is typically explored from an energy security or climate change perspective. This book on the other hand explores the potential consequences of large-scale production of transport fuel substitutes on rural areas, principally in developing countries but also in some poor rural areas of developed countries. Three key concerns are examined with a North-South perspective: ecological issues (related to land use and biodiversity), pro-poor policies (related to food and land security, gender and income generation) and equity of benefits within the global value chain. Questions raised in the book include whether or not biofuels can be pro-poor, and if smallholder farmers can be equitably integrated in the biofuels global supply chain.

www.unep.org

reflections

ACHIM STEINER

UN Under-Secretary-General and Executive Director, UNEP

World Environment Day (WED) is your day – an occasion for the public to demonstrate, by practical and inspiring grass roots action that positive environmental change is alive and kicking in villages, towns and cites across the globe. It also needs to be a Day for transformational thinking and intellectual debate, which is why UNEP commissioned a study on biosequestration – an inelegant word perhaps but one with extremely elegant and far reaching implications.

Carbon capture and storage is an increasingly popular solution to the climate change challenge. The idea is that carbon emissions from power stations and other sources can be captured, consigned to underground stores in the earth's geology, and contained within them. By some estimates it could contribute 15 to over 50 per cent of the global effort to stabilize emissions of greenhouse gases at 450 to 750 parts per million.

Not everyone is convinced, however. Some experts are concerned that the technology is not tried and tested and that the CO_2 instead of being locked away, could suddenly bubble back into the atmosphere.

Yet there is another form of carbon capture and storage that has been perfected over hundreds of millions of years. Forests naturally remove carbon, locking it away in tree trunks and branches, and returning it to soils when leaves are shed. But instead of maintaining and enhancing nature's own solution, the world is destroying it. Indeed some 20 per cent of greenhouse gas emissions come from clearing and burning forests.

Paying tropical forested countries to manage forests could reverse this and Reduced Emissions from Deforestation and Forest Degradation (REDD) must be a key component of 'sealing the deal' at December's crucial UN climate convention meeting in Copenhagen. By one estimate, Indonesia alone could get compensation of $1 billion a year by reducing its deforestation rate to one million hectares annually.

UNEP's World Conservation Monitoring Centre estimates that some 15 per cent of carbon is locked away in trees and forests in the world's National Parks and protected areas. Boosting investment in these could not just increase carbon capture and storage but trigger a wide range of other benefits, from soil and water stabilization and reduced biodiversity loss to improved tourism revenues and new jobs. Mexico – the global host of WED 2009, which has Latin America's second largest closed-canopy forest – is among those in the forefront of the REDD debate.

Other natural systems – from peatlands and wetlands to grasses, soils and shrubs – also have the ability either to release or to absorb carbon. The seas and oceans are cycling up to 40 per cent of CO_2 emissions for free.

Over the past 10,000 years, farming has domesticated and promoted single season annually cropped cereal, oil and leguminous plants. But experts suggest that moving 'back to the future' to perennials, multi-year crops with deep roots, will boost soil fertility and stability 50 fold and may prove more resilient in a climate changed world. They are also 50 per cent better at carbon capture and storage than their annual cousins. And because they do not need to be planted every year, there is less need to use energy-burning farm machinery, pesticides and fertilizers.

Carbon capture and storage may seem a simple and straight forward technological fix, but does it make our economies more resource and more fuel efficient, or simply perpetuate a dependency on fossil fuels and energy insecurity. What if the hundreds of billions of dollars now being invested in it were partly diverted into its biological counterpart. This well proven, natural system could well provide, as they say, "a bigger bang for our buck", which not only removes carbon dioxide but addresses wider sustainability challenges including a true Green Revolution and the poverty-related UN Millennium Development Goals.

Building the bridge

"...we need this planet because we do not have anywhere else to live."

JUAN RAFAEL ELVIRA QUESADA

Mexican Secretary of Environment and Natural Resources speaks with Satinder Bindra

Mexico is no stranger to hosting the UN's premier outreach event on the environment - World Environment Day (WED). The country last hosted it in 1990, and late last year won a fiercely competitive bid to become only the second country after China to do so twice.

The theme of this year's World Environment Day is 'Your Planet Needs You - Unite to Combat Climate Change'. As part of its responsibilities, the Mexican government will stage festivities over five days in various parts of the country. The celebrations will provide an opportunity for the government to demonstrate how its payments to hundreds of thousands of poor people for protecting forests not only helps in the fight against climate change, but can also alleviate poverty.

This year the international community will also be watching the event closely, because WED takes place just months before what it is hoped will be a meaningful deal for reducing greenhouse

gas emissions in Copenhagen, Denmark, in December.

As one of its planned activities for WED, Mexico has pledged to act as a bridge between the North and South to help seal a deal in Copenhagen. To find out more about Mexico's environmental ambitions and WED plans, UNEP's director of communications Satinder Bindra sat down for a freewheeling discussion with Mexico's Secretary of State for the Environment, Juan Rafael Elvira Quesada.

Here are some excerpts:

Mr Secretary, why did Mexico decide to host the World Environment Day festivities and what does this really mean for the country?

"We needed to push environmental topics on to the national agenda, and we think it is a very good opportunity for Mexico to show how we can work together - all the countries – to make a call to everybody to create awareness of the need to work on the environment. I think it is very important for Mexico, for Central America and for all the world."

You talked about reaching the region around Mexico, and also the world: so can you give us a flavour of what has been planned for 5th June and the days surrounding it?

"We are including all of society as a whole – young people, students, children, businessmen and NGO's - in the celebrations. The point is to showcase five different places - Lakes, Rivers, Beaches, Forests and these kinds of ecosystems - all in different parts of Mexico. We have to show how we are going to protect these places.

For World Environment Day we will invite people to do something related to cultural activities, academic and scientific activities, activities in general for all of society, so that everybody can be part not only of the problem but also of the solution."

What is the message you want to send to the rest of the world during these celebrations?

"We think that we can tackle a big problem called climate change by reducing poverty and by protecting the forests in Mexico. This solution could be part of the world solution in many of the continents, like Africa, Asia, Latin America. What we want to show is that everybody can work towards climate change, and we can work towards reducing poverty and we can also work towards saving the forests."

You talked about combating climate change, but what about reducing emissions? Is that going to come up in all the discussions and seminars during these celebrations?

"Yes, we want to show the world our special program for climate change. The president wants to show the world what we are doing to mitigate or cope with Climate Change. Mexico can reach a voluntary goal [to reduce emissions] and can work with the rest of the world because everyone in the world can do something against climate change. You are part of this planet and your planet needs you. To put it another way, we need this planet because we do not have anywhere else to live."

Mr Secretary, in December this year there will be a very important meeting in Copenhagen to try to reduce growing emissions. Can WED 2009 do anything to convince the countries of the world that an agreement there is critical for the planet?

"Yes of course we want to build the bridge for many countries to go to Copenhagen and reach the agreement. It does not depend on where you are and what is your classification, it depends on how you can invite everyone in the world to work and help to get a good agreement, a world agreement to really protect the environment and the planet."

GREEN GROWTH

"Against the backdrop of the global credit crisis and economic change, the Grenelle Environnement will cause investment of some 400 billion euros and create more than 550,000 jobs in France."

JEAN-LOUIS BORLOO

is Minister of Environment, Energy, Sustainable Development and Land Management – France

While the world awaits its December date with destiny in Copenhagen, France intends to show that sustainable development is both possible and a source of well-being, competitiveness, growth and employment. Two years ago, spurred on by President Nicolas Sarkozy, the French Government launched a wide ranging concerted approach known as the 'Grenelle Environnement', a round table bringing together all sustainable development stakeholders, including the State, local authorities, non-governmental organizations, trade unions and businesses. After several months of activities and negotiations, it produced a sectoral sustainable development strategy for the next 10-15 years. This aims to lay the foundations for a new growth model - 'green growth', based on efficiency and effectiveness, carbon and energy savings and quality of life.

The Grenelle Environnement has a series of goals that can be quantified and evaluated. They include cutting greenhouse gas emissions fourfold between 1990 and

2050, reducing the energy consumption of existing developed land by 38 per cent, cutting carbon dioxide emissions from transport by 20 per cent by 2020 and increasing the share of renewable energy used to 23 per cent by 2020. It is based on six major fields of work, three of which are directly related to efforts to combat climate change: buildings, transport and renewable energies.

Buildings are responsible for more than one quarter of our greenhouse gas emissions, so the strategy provides for the general introduction of a 'low consumption' standard (50 kWh/m2/year) for new buildings from 2012. By 2020 'positive energy' buildings – those that produce more than energy than they consume – will be widely introduced. There will also be a thoroughgoing thermal rehabilitation programme aimed at renovating some 400,000 homes per year. French tax policy has been amended to encourage people to finance such schemes, or buy particularly energy-efficient homes, with the introduction of an interest free eco loan.

As for transport, the Grenelle Environnement's goal is to provide a credible and sustainable alternative to road travel. This is not a question of imposing bans or restrictions, but of giving people the freedom to choose how they wish to move around. So it provides for constructing an additional 2,000 kilometres of high speed train lines, 1,500 kilometres of new public transport routes in towns and cities, three marine highways and two rolling roads (which carry lorries by rail) to encourage a modal shift in goods.

We have also tested the idea of a 'green price', as a result of the success of our 'green bonus' scheme. A tax on the most polluting vehicles means that cleaner ones are subsidized and cheaper.The aim is to entice consumers into buying the ones with the lowest carbon and fuel consumption and to encourage manufacturers to offer ever more energy efficient products. Just one year on the French automotive market is changing shape. Sales of vehicles emitting no more than 130 grams of carbon dioxide per kilometre have risen by half, while those of ones emitting more than 160 grams have fallen by 40 per cent. The average emissions of new vehicles sold in France have fallen by 9 grams of carbon dioxide per kilometre in a single year, six times the previous rate of progress.

France also wants to encourage its automobile manufacturers to market vehicles that emit little pollution as swiftly as possible, given that these are universally accepted to be the future. The Government will therefore invest some 400 million euros over three years in researching them. And from this year, in its quest to set a good example, it will undertake a thoroughgoing review of its fleet with a view to replacing any vehicles over 10 years old with more energy efficient ones.

The Grenelle Environnement also marks a genuine watershed in the use of renewable energies. Last November, I outlined a significant renewable energy development plan to exploit our potential to the full. Over 12 years it will double our annual production of renewables increasing our geothermal energy capacities sixfold , our wind energy tenfold , and our photovoltaic solar energy 400 times over. We are also going to launch major energy infrastructure projects: renewing contracts for the 400 largest French dams, constructing at least one solar power station per region by 2011 and launching a major call for tenders to produce electricity from biomass, creating integrated power of 250 MW, equivalent to one fourtn of the output of a large nuclear power plant. And we will spend 1 billion euros over the next two years on developing renewable heat with the goal of equipping some 2 million homes with heat pumps by 2020.

Against the backdrop of the global credit crisis and economic change, the Grenelle Environnement will cause investment of some 400 billion euros and create more than 550,000 jobs in France. The strategy is founded on three certainties. First, that our current growth model is not viable in the long term. Second, that an economy that consumes less energy is an economy that spends less money and is therefore more competitive. Third and last, that carbon neutrality, energy efficiency and quality of life are the three key competitive advantages in tomorrow's economic battle.

awards and events

ICLEI World Congress 2009

From 14 to 18 June, over 700 local and national government leaders as well as leaders from the UN, NGOs, academia and the business community will come together in Edmonton, Canada for the ICLEI World Congress 2009. The Congress, held under the theme "Connecting leaders", will explore the achievements of the most advanced cities and towns, and debate what can be done to advance local action for sustainability.

www.iclei.org/index.php?id=7756

World Migratory Birds Day

World Migratory Bird Day, which started in 2006, is a global awareness-raising campaign highlighting the need for the protection of migratory birds and their habitats. This year's theme is "Barriers to Migration" - highlighting the many man-made obstacles birds face during their migration. On 9-10 May, people around the world took action and organized public events such as bird festivals, education programmes and birdwatching excursions. The Day's activities take place in many different countries and places, and are all linked through the global theme. Anyone interested in organizing an event to mark World Migratory Bird Day can do so and is encouraged to register their planned activity on the campaign website.

www.worldmigratorybirdday.org/2009/index.php

Home

Home is a new feature-length film by world-renowned French photographer Yann Arthus-Bertrand which will be released for free around the world on 5 June for World Environment Day. Yann Arthus-Bertrand takes viewers on a unique journey all around the planet to contemplate and understand its workings and show us that the marks we leave behind are having a negative impact on its well being. The film is a travel notebook showing only landscapes captured from above. In this sense Home calls for a new awareness, because as we observe ourselves from the air, we see our world in a whole new light. This step back gives us pause to consider our interaction with the environment. The movie is a non-profit initiative, and income generated from its viewing will be transferred to Arthus-Bertrand's association, GoodPlanet, which fights for the protection of the environment. The shooting of the film was carbon neutral and the carbon emissions that were produced during filming were offset by the support of environment-friendly projects.

www.home-2009.com/

Green Star Awards

Green Star

The Green Star Awards are a joint initiative between the UN Office for the Coordination of Humanitarian Affairs, the UN Environment Programme and Green Cross International to recognize those who have made remarkable efforts to prevent, prepare for, and respond to environmental disasters around the world. The awards, given every two years, aim to raise the profile of environmental emergencies and disasters and underline the connection between environmental impacts of natural disasters, technological accidents and complex emergencies, and their consequences for affected populations and providers of humanitarian assistance.

Among the inaugural winners of the Green Star Awards announced in May were: the Spiez Laboratory in Switzerland; the Center for Scientific Support in Disaster Situations (CENACID) in Brazil; the governments of Sweden and The Netherlands; and an environmental response specialist, Michael Cowing, of UNEP.

www.unep.org/greenstar/

International Day for Biological Diversity

Invasive alien species are one of the greatest threats to biodiversity. Since the 17th century, they have contributed to nearly 40 per cent of all animal extinctions for which the cause is known. This was the focus of this year's International Day for Biological Diversity on 22 May. The Day aims to raise public awareness and devise practical steps to tackle the problem. Meanwhile, time is running out to achieve the 2010 goal to significantly reduce the current rate of biodiversity loss at the global, regional and national level, as agreed in 2002 by the Parties to the Convention on Biological Diversity.

www.cbd.int/bd/2009

Tunza Youth Conference

The Tunza International Children and Youth Conference in Daejeon (Korea) in August will gather one thousand children and youth to share their views and concerns on climate change and develop a statement which will be presented to the December 2009 climate change meeting in Copenhagen. UNEP is co-organizing the conference with the UNEP National Committee of Korea, in partnership with UNICEF and other key UN partners. The 800 children and 200 youth will discuss topics ranging from global warming to biodiversity, green jobs and sustainable lifestyles. A Global Town Hall meeting on 20 August will connect the conference via webcasting to virtual participants around the world, including high profile UN officials and political and business leaders.

www.unep.org/tunza/

TUNZA

SOLAR REVOLUTION

HRH PRINCE EL HASSAN BIN TALAL OF JORDAN

is the founder of the Hashemite Aid and Relief Agency and President Emeritus of Religions for Peace, and was President of the Club of Rome 1999 to 2007

Environmental stability is an essential human need and right. It flows from our commitment to ensuring a sustainable quality of life and human dignity, emphasising our connectedness with all living beings, and our responsibility to our only planet, the Earth.

Yet, as Dennis Meadows tells us in his *Thirty Years Update of Limits to Growth*, humanity is now overburdening the carrying capacity of Mother Earth by a factor of 1.2. Furthermore 85 per cent of the consumption and depletion of natural capital is caused by the 'rich minority', 20 per cent of the world population.

At the same time, as the EastWest Institute and the International Task Force on Preventive Diplomacy remind us: "*The Foreign Policy 2007 Failed State Index* reports that weak and failing states are often both the result of conflict and the cause of fresh conflict ... 'breeding grounds for terrorism, organised crime, weapons proliferation, humanitarian emergencies, environmental degradation and political extremism'. At the same time, new threats, such as competition over land and water resources arising from population pressures and aggravated by climate change, have emerged."

"The harmful impact of climate extremes on human livelihoods, combined with heightened competition for scarce resources, has triggered disputes over territory, food and water supplies – and over social and cultural traditions."

Pessimists further assert that – even if the UN Millennium Development Goals were met – the world in 2015 would still have 900 million people who have to walk more than a mile a day to get drinking water and 1.6 billion with no sanitation facilities – while in 2020, more than two billion people would still live in urban slums.

"Solar power from deserts – through cooperation between the sun and technological belts – will be cheaper than power produced from fossil fuels, especially if these are charged with their unpaid environmental costs."

How can we accept a situation where 20 per cent of the world's population produces 85 per cent of its environmental degradation? As the capacity of the natural world to absorb carbon dioxide diminishes, the problems created by growing energy use can only increase exponentially. We have no choice but to concentrate our abilities on alleviating the suffering of humanity and the environment.

Total worldwide energy use is now 8 billion tons of oil-equivalent per year. This might increase to 40 billion tons by the year 2060. Thereafter, known deposits would only be adequate for the next 80–100 years depending on the speed at which consumerist development steams ahead.

The harmful impact of climate extremes on human livelihoods, combined with heightened competition for scarce resources, has triggered disputes over territory, food and water supplies – and over social and cultural traditions. My region, West Asia-North Africa (WANA), is overwhelmed with conflicts and disputes, and no political mechanisms for conflict resolution or prevention exist. The area in which these disputes take place covers the northwest corner of Africa, southeast to the Congo and the Sudan, the Arabian Sea and then north to the top of the energy ellipse that contains 70 per cent of the world's oil and 40 per cent of its gas.

Supra-national cooperation in joint water and energy projects could create renewable energy to power the world's growing population and provide fresh water from desalination without harming the environment. The DESERTEC concept examines creating secure, clean, and affordable power from the largest but least-tapped source of energy on earth, solar radiation in deserts. It could be put into service for energy, water and climate security for Europe and the WANA region through pursuing solar cooperation between the world's technology belt and its sun belt to fight climate change, energy shortage and water scarcity.

Using solar energy – or any other form of renewable energy – should be achieved in an environmentally compatible way. Here the deserts of the earth can play a key role. Day by day they receive about 700 times more energy from the sun than humankind consumes by burning fossil fuels. They have the best conditions for solar radiation and would experience the least impact from deploying collectors to harness it. Here clean power can be sustainably produced by solar thermal power plants at any volume of conceivable demand. It can then be transmitted by high voltage direct current lines to more than 90 per cent of the world's population. This gives our deserts a new role. Together with the many other forms of accessible renewable energy, they would enable us to replace fossil fuels and so end the ongoing destruction of our natural living conditions.

Solar power from deserts – through cooperation between the sun and technological belts – will be cheaper than power produced from fossil fuels, especially if these are charged with their unpaid environmental costs. It can provide sufficient sustainable electricity to meet the demand of fast growing populations in the WANA region, and deliver energy for the sea water desalination required to avoid a fresh-water crisis. It can stimulate industrialisation and economic development by becoming a long-term export product, and promote energy and water security.

Significantly, projects like DESERTEC can also open a new chapter in relations between the people of the European Union and WANA. Their governments must establish adequate political, legal and financial frameworks to enable new forms of cooperation and investment. Constructing new concentrating solar thermal power plants has already begun already in Spain and in the USA. In the WANA region, initial projects are being developed in Algeria, Egypt and Morocco and are planned in Jordan, Libya, Tunisia, and United Arab Emirates. Algeria and Morocco have already brought in feed-in tariffs for clean power.

Providing people with practical means of combating climate change should be associated with giving them hope for a better future. This can be done worldwide by achieving fundamental human rights and empowering the silent majority - the poor and the vulnerable. Their well-being and rights - and the carrying capacity of our planet - must be given particular attention through a focus on human security, to avoid stalling and reversing the turning wheel of human development. Collective efforts – engaging states, enterprises, civil society groups and individuals – are essential in developing a common global action plan to ensure world stability.

The world's consumers and producers of prosperity are the same people. They are at the receiving end of the effects of historic greenhouse gas emissions, which are hurting the rich a little and the poor a lot! The early developed world – the USA, Canada, Europe and Japan – has an average per capita GNP of $34,000 a year; in the remaining, later developing world it is $2,200. Such a prosperity gap is a time bomb, but might provide a way forward. Would it not be a strategy for human security and global developmental justice if the early developed world spent a small fraction of its tremendous income advantage to establish an inexhaustible and sufficient energy source for everyone based on renewables? Just one thousandth of this income advantage, over $30,000 billion a year, would be more than sufficient to launch the DESERTEC Concept in the most suitable desert regions around the world, within one or two decades – thus overcoming global energy inequity and social injustice and ending the increasing impetus of climate change.

numbers

3.6 million
Cost in US$ for offsetting all the greenhouse gas emissions (estimated at 300,000 tonnes), which will be produced by the Vancouver 2010 Games, including those from airplanes bringing thousands of athletes and spectators to the western Canadian city
– Vancouver Organizing Committee

501
Number of UN-backed clean energy projects in China as part of the Clean Development Mechanism, as of 31 March 2009. China has the highest number of such projects, followed by India (with 411) and Brazil (with 156). Globally, the United Nations has approved 1,539 pojects around the world – **Reuters**

267
Worth in billions of pounds of the so called eco-barons – tycoons who have made either serious investments in green technology and businesses or hefty financial commitments to environmental causes
– Business Times Online

11
Amount in billions of dollars being set aside for "smart grid" investments under President Obama's stimulus package
– NY Times, Green Inc.

8
Percentage by which airlines will reduce their carbon emissions this year. About 6 per cent of the forecast carbon cut will come as a result of carriers flying fewer planes in 2009, and a further 1.8 per cent reflects steps to improve energy efficiency
– International Air Transport Association (IATA)

40
Percentage of the world's electricity that renewable energy technologies such as wind and solar power could supply by 2050
– Helsinki University of Technology

51.4
Billions of dollars in worldwide revenue created by wind power in 2008
– Business Green

50
Investment in billion of pounds needed to make Saharan thermal solar power an attractive and viable prospect for private investors
– International Institute for Applied Systems Analysis

4,000
Number of cities around the world that switched off their lights for Earth Hour - a global call to action on climate change – **WWF**

LEARNING
for Life

FERNANDO HADDAD

is Brazil's Minister of Education

The past six years – since the June 5, 2003 World Environment Day – have witnessed an astounding force of mobilization and passion permeating environmental education in Brazilian schools. On that day, the National Children and Youth Conference for the Environment was implemented in secondary schools throughout Brazil, and has proven to be a landmark in the country's public environmental education policy management.

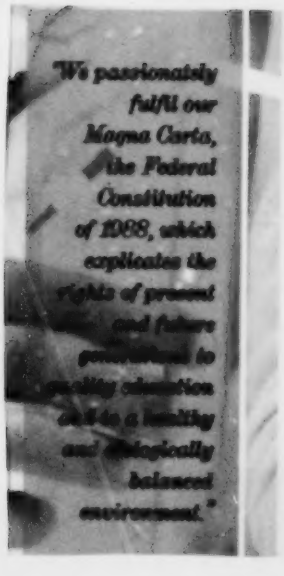
The conference's success is reflected in the figures: the first one, in 2003, involved 15,452 schools and mobilized 5,658,877 people throughout the country. The second, in 2005-2006, reached 11,475 schools and communities and 3,801,055 persons, and witnessed our youth delivering a charter to President Lula. This *Charter of Responsibilities, "Let's Take Care of Brazil"*, commits to constructing "fair, happy and sustainable societies with responsibilities and actions that fulfil dreams and needs".

The Third National Conference process was held during 2008-09 in 11,670 schools involving over 4 million people in the school and state-level debates, culminating in a national event in April 2009. As the conference occurred in the midst of a global environmental/economic crisis, our environmental education system has been confronted by a triple challenge:

- **the psychological**: building significant knowledge without creating fear of the catastrophe that is revealed or paralysis in face of potential destruction;
- **the educational**: proposing a contemporary education solution, which may rescue the social function of the school as a creative and transformative learning environment. My ministry's Education Development Plan enables integral education in an initiative that seeks quality in the teaching-learning process and student retention; and
- **the planetary**: engaging in a high level debate so as to be able to address global environmental change through sustainable societies.

The task of the Ministry of Education is to involve students, teachers, youth and the school community in building a sustainable Brazil, with equity, diversity and justice. This is accomplished in conjunction with the Ministry of the Environment through the "Managing Commission" formed ten years ago by the National Environmental Education Policy Law which establishes environmental education principles, objectives and directives to be incorporated into public agencies, educational institutions, communications media, companies and society.

An educational element was also included in the 2008 National Plan on Climate Change, making the ministry responsible for "Implementing



sustainable educational spaces through re-adapting buildings (school and university) and management, and through teacher education and inserting the subject of climate change into the curricula and teaching material."

But how to incorporate all of this in formal education inside the classroom? How could we create a school community with a responsible and committed attitude towards local and global socio-environmental issues?

According to the 2001 School Census undertaken by the Anisio Teixeira National Institute of Educational Studies and Research, only 61 per cent of the secondary schools declared to have implemented environmental education schemes. In the 2005 census, environmental education was almost universal, as declared in 97 per cent of schools. The Children and Youth Conference could be seen almost as a "pedagogical pretext" to include and update the debate so urgently needed in society, from a critical and participative environmental education perspective.

The third National Conference incorporated the topic *Global Environmental Changes: think + act in the school and in the community*. Quality didactic material was distributed to all secondary teaching networks in the country (58,000 schools) with the objectives of: contributing to improving school performance based on the results of the Basic Education Development Index; encouraging the inclusion of sustainability and the socio-environmental challenge in the school Political-Pedagogical Plan; and strengthening the role of the school in constructing public education and environmental policies.

The material provides tools for traversing environmental issues and interdisciplinarity in the classroom, while respecting the complexity of the subject and not over-simplifying. Socio-environmental changes beyond climate change are treated systematically and integrated into the sciences, history, geography and languages.

The topics involve the four elements – earth, water, fire and air – with the contemporary problems affecting people and natural systems throughout the planet. Each topic includes debate on sustainable actions for mitigative, adaptive, preventive, and transformative measures. The material proposes changes to the world-view, that rescue values that improve quality of life, and that rethink human responsibilities for the present and future of life on earth.

"Throughout the country, Youth Collectives and the Youth Network for the Environment and Sustainability are partners in facilitation, mobilization and training based on the principles: 'youth educates youth, youth chooses youth and one generation learns from the other.'"

Far from being just an event, the Conference offers continuity, since it is part of a larger programme, which encompasses continuous education of teachers and the creation of school "Commissions of the Environment and Life Quality". Each commission promotes Agenda 21 projects through interaction between the school and the community, so as to integrate environmental education in the teaching system. Throughout the country, Youth Collectives and the Youth Network for the Environment and Sustainability are partners in facilitation, mobilization and training based on the principles: 'youth educates youth, youth chooses youth and one generation learns from the other.'

We passionately fulfil our *Magna Carta*, the Federal Constitution of 1988, which explicates the rights of present and future generations to quality education and to a healthy and ecologically balanced environment. This can be achieved with bold and modern policies, the democratic participation of society, the integration of school disciplines with traditional knowledge, and school communities that consider all aspects of the quality of life – environmental, economic, political, social, cultural and ethical.

The 3rd National Conference received 70 international Observers from 43 countries, in preparation for the International Children and Youth Conference – *Let's Take Care of the Planet* – which will be held in Brasilia from June 5 - 10 of 2010. The International Conference has been incorporated into UNESCO's Decade of Education for Sustainable Development, and will help to futher the debate on UNDP's *Eight Goals of the Millennium*. We also reaffirm values and actions proposed by civil society, such as the Treaty on Environmental Education for Sustainable Societies and Global Responsibility, the Earth Charter, the Agenda 21 and the Charter of Human Responsibilities.

products

Garbage-powered garbage truck

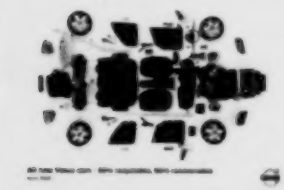
An electric refuse collection van powered by the rubbish it collects has been put into action by Kirklees Council in Yorkshire, in what council leaders believe to be a world first. The battery-powered electric van, supplied by Smith Electric Vehicles, will be used to empty 25 newly-installed split litter and recycling bins around Huddersfield town centre. The waste that cannot be recycled will then be taken to a local Energy from Waste (EfW) plant, which combusts it to generate electricity that will in part be used to recharge the vans battery.

www2.kirklees.gov.uk/.../fullstory.aspx?id=577

Solar Drier

As a land-locked country with poor transport infrastructure, no glass manufacture or canning facilities, Ugandan farmers were frequently left with fresh agricultural produce going to waste for lack of markets. Adam Brett and Angello Ndyaguma have turned this excess fruit into a profitable export business by designing affordable, easy-to-build solar driers made from frames, locally available mosquito meshing and long lasting plastic (the only imported material). Now their Ugandan company, Fruits of the Nile produces and exports about 120 tonnes per year of high-quality dried banana and pineapple from its factory in Njeru. The fresh fruit is prepared and dried in simple solar driers that serve 120 producer groups in rural areas.

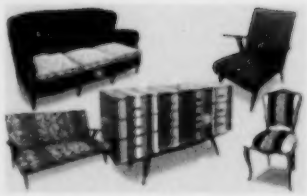
www.fmfoods.co.uk/partners/fon.htm



Recyclable cars

Safety has always been the first thing that springs to mind when the automotive conversation turns to Volvo. However the announcement that all new Volvos are 85 per cent recyclable and 95 per cent recoverable is set to make the Swedish automakers synonymous with eco-friendliness. Volvo is designing its cars with an eye to using recycled non-petroleum derived parts, and making them easier to recycle when their useful life is over. Volvo cars now come equipped with dashboards and ceilings made of flax and cellulose rather than petroleum-based polymers, as well as car seats manufactured from natural fiber and soya-based foam fillings.

www.volvocanada.com/Experience/CleanAllItsLife.aspx?lng=2



Vintage Furniture with a Modern Twist

Livin Pop's philosophy is to make old new, and their aesthetics are inspired by the 1950s and 1960s. The brand is run by Lucila Nissen and Sofia Moreno, two Brazilian designers who sell their furniture through their website. For those outside Buenos Aires, their pieces offer great ideas to rejuvenate old bits and pieces you may have found at the flea market.

www.livinpop.com.ar/

Swept away

Quiet, effective and eco-friendly – the Ultra Silencer Green Vacuum cleaner delivers on all three counts. This new gadget from Electrolux is made up of 55 per cent recycled plastic, a process that saves two litres of crude oil and 80 litres of water per vacuum cleaner. Better yet, this energy efficient vacuum cleaner uses 33 per cent less energy during use than other equivalent cleaners. And the cherry on the cake : the vacuum cleaner is also the quietest model on the market.

www.appliancist.com/green_appliances/electrolux-ultrasilencer-green-vacuum-cleaner.html

A greener apple

Dubbed the world's most energy-efficient desktop computer, Apple's Mac mini has been designed to make the tiniest environmental impact possible. Specifically, energy-efficient hardware components in the computer dynamically adjust power consumption to reduce the energy used overall. Apple has also worked hard to eliminate many of the toxins that are a common part of computer manufacturing. For instance, the new machine is BFR-free and its internal cables are PVC-free. Finally, the volume of the Mac mini shipping box is 60 per cent smaller than previous models, allowing more boxes to be shipped at one time, which means fewer boats and planes are used, resulting in less CO2 emissions.

www.apple.com/macmini/environment.html

practical action

1. PLASTIKI

Around the World
in a Soda Bottle Catamaran

In May, David de Rothschild and a handpicked crew of experts will set sail 8,000 miles across the Pacific Ocean in a boat made out of recycled consumer plastic bottles. The Plastiki's mission is to capture the imagination of the global media and bring people around the world to rethink our human impact on the natural world and oceans. The voyage will sail through a number of exciting, challenging and environmentally sensitive regions, including the ominously named Eastern Garbage Patch, an area six times the size of England where plastic outweighs plankton by 6 to 1 – essentially the world's largest waste dump.

Supported by Adventure Ecology's network of global supporters and institutions, the Plastiki aims to use the expedition to heighten worldwide consciousness of the extreme challenges that our oceans and their inhabitants face due to excessive human debris, overfishing and a rapidly changing climate. Developed and built in association with world-leading institutions, engineers, designers, marine architects and sustainability experts, the 60-foot Plastiki catamaran exemplifies groundbreaking thinking and sustainable design solutions at every level.
www.adventureecology.com/theplastiki

2. CAPE COURIERS

A Courier Company Cuts its Footprint

Recognizing the critical role that the transport industry plays in global warming, Delia Claasen, the founder of South African delivery company Cape Couriers, decided it was time to put a cap on her company's carbon dioxide emissions. Currently, Cape Couriers employs an external consultant to measure the company's carbon footprint and Claasen and her employees are all striving to reduce their electricity, waste, vehicle and air travel impacts wherever possible.

Beyond this, Cape Couriers have commissioned Food & Trees for Africa, the 2007 UNEP Sasakawa Award winner, to help them voluntarily offset these emissions. Through the National Tree Distribution Programme, FTFA receives numerous applications from disadvantaged schools and communities in barren, dusty environments which need trees to address environmental and sustainable development issues.

In order to offset a year's emissions, Cape Couriers is now in the process of donating more than 2,300 trees to schools and community projects around South Africa.
www.capecouriers.co.za/

3. CLEAN UP THE WORLD

Mobilizing Communities to Think Global, Act Local

'Communities uniting to combat climate change' is the proactive theme of this year's Clean Up the World Campaign, a worldwide drive to clean up the environment. The initiative,

which first started in 1989 with the Sydney Harbour Clean Up, is now a global campaign that inspires communities around the world to clean up, fix up and conserve their local environment.

With this year's campaign, Clean Up the World founder Ian Kiernan made a special call for communities to join together and play a part in helping create a better environment for the future. "Unity is of great importance when it comes to addressing the causes of climate change.I think we all — no matter where we live — have a responsibility to protect our planet and there's no better time to start than now", said Kiernan.
www.cleanup.com.au/au/

4. VELIB' Velib'
Free Bikes in Paris

In a bid to encourage people to give up the motor in favour of pedal power, the city of Paris has launched a free bicycle scheme called Velib' — getting hundreds of Parisians to switch from four wheels to two, especially for short distances.

The system offers more than 10,000 bikes, allowing riders to pick up and drop off bicycles throughout the city at 750 locations. The bike does not have to be returned to the same pick-up point: you can take a bike from a rack near the Eiffel Tower, cycle to the Pantheon and leave it in the nearest Velib' stand there.

To access the bikes, riders can select a one-day card for 1 euro, a weekly card for 5 euros or an annual card for 29 euros — giving Parisians a real incentive to stick with the scheme for the long haul.

Paris is just one of a growing wave of cities offering free cycle schemes. Copenhagen, Montreal, Helsinki and Barcelona are some of the others, and more cities are considering similar systems.
www.velib.paris.fr/

5. BIOGAS IN KENYA
Meru's sustainable prison

In prisons worldwide, sewage disposal from a large number of inmates is often a major health hazard for both the prison and the surrounding area. Meru GK prison in Kenya has found a sustainable solution, treating its sewage and turning it into fuel.

A 130 cubic-metre fixed dome digester built by the German development agency GTZ and funded by the EU is fed human waste, which it uses to produce between 50 and 90 per cent of the energy needed to cook for approximately 1,000 inmates. The system is expected to provide the prison with cost savings of $36,000 annually, all the while reducing the pressure on local wood supplies. And after the treatment, the bio-effluent is used as fertiliser for crop production.

In this case, the project pays for itself over time, and also allows for a drought-stricken region to make optimum use of the little water that is available. According to the project's Planning and Monitoring Adviser, Johannes Odhiambo, "the biodigester is an excellent way to put human waste to productive use, while also protecting the environment."
http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/8524.htm

MONEY CAN GROW ON TREES

"Tropical deforestation accounts for 15 to 20 per cent of anthropogenic emissions of greenhouse gases (GHG) worldwide."

Forests have permanently stabilised and sequestered carbon since the beginning of life on the planet. They now contain around 60 per cent of the carbon stored in terrestrial ecosystems. Releasing this could disastrously accelerate climate change. Yet enhancing forests' carbon storage over the long term could permanently reduce the concentration of the greenhouse gas in the atmosphere.

Tropical deforestation accounts for 15 to 20 per cent of anthropogenic emissions of greenhouse gases (GHG) worldwide, but is not yet addressed under the Kyoto Protocol. Afforestation and reforestation are eligible project options under its Clean Development Mechanism (CDM), but the project registration process is so complex that forestry provides only two of the 1,511 projects so far registered. So it is fair to say that the Protocol has failed to integrate land use, the third largest source of CO_2 after energy supply and industry. This in turn has led to a failure in integrating Africa into global carbon markets, since most of the continent's GHG come from land use. This is now being recognized by the international community. The United Nation's Climate Change Conference in Bali in December 2007 kicked off a hot debate on how to provide the right incentives to governments and communities to protect and enhance forests.

The main reason for the lack of integration of carbon credits produced by CDM Afforestation/ Reforestation (A/R) projects is

ANNA LEHMANN

is Head of Policy and Regulatory Affairs at Sindicatum Carbon Capital and chair of the Forestry and Land Use Working Group of the Carbon Markets and Investors Association

"So it is fair to say that the Protocol has failed to integrate land use, the third largest source of CO_2 after energy supply and industry."

their temporary nature. Forestry CDM credits are only valid for 5 – 20 years, and then must be replaced, so they are not fungible (exchangeable) with credits produced by projects that reduce emissions from fossil fuel use. Traders and compliance buyers lack understanding of how to use them, so their prices are heavily discounted. And industry covered under the traded sector of the European Emissions Trading Scheme (EU ETS) is not allowed to purchase forestry credits for its own compliance, so as to avoid confusion in emission inventories. The EU ETS is still the largest offtaker for CDM credits, and thus there is no demand for A/R projects. All this means that the projects gain very little financial incentive from the CDM, and thus are economically unviable and attract little investment. The forestry projects that still manage to survive economically, and make their way

"...without fungibility of credits there is no demand, and without demand there is no private sector investment."

through the methodology jungle, apply for validation and registration in the voluntary carbon offset space. To put it simply: without fungibility of credits there is no demand, and without demand there is no private sector investment.

Private finance is urgently needed to tackle global deforestation. The Eliasch Report for the UK Prime Minister stresses that only the combined efforts of public and private funds can provide the necessary short, medium and long-term funding needed to halve deforestation by 2020. It estimates that $7 billion per year can, and must, come from carbon markets, leaving a funding gap of $ 11-19 billion that would need to come from a mix of public and private sources.

Deforestation is driven on three different levels:

- local (encroachment, illegal logging etc.);
- national (infrastructure works, urban expansion etc.); and
- international (impacts of agricultural policies, logging bans etc of large countries).

Thus, a combined effort at project, national and international level is needed.

At project level, the Voluntary Carbon Standard has been at

the forefront of developing forestry carbon standards for voluntary projects: it has developed a robust system for issuing permanent forestry credits, which works in developing countries. Project developers have to identify key risks to the permanence of the project which are then categorized and assigned a level of magnitude, gauging the level of the threat and its potential impact. The project has to set aside a buffer of 10 to 60 per cent of its area, depending on its risk category.

At national level, land use planning is needed as a first step. Providing long-term regulatory certainty is essential if investors are to deploy capital. National level land use planning will require capacity building to enable governments to take informed decisions on their economically and ecologically optimal forest cover. Too little forest cover will lead to increased droughts, floods, salinisation, and drinking water scarcity, which will drive poverty. Too much forest cover, on the other hand, limits land for agricultural production and reduces foreign currency income (if agricultural commodities are exported) or threatens local livelihoods (in the case of subsistence farming). Optimal forest cover balances out different land use purposes, resulting in optimal social, environmental and economic benefits, but arriving at it is a long process. A high level of subsidiarity in decision making during the land use planning process is essential if there is to be a balanced outcome between national and regional level priorities. At the same time, emission inventories for land use needs to be set up, nationally and regionally, a long term activity that will require substantial public investment in capacity building and technology transfer between now and 2020.

"Optimal forest cover balances out different land use purposes, resulting in optimal social, environmental and economic benefits."

Once optimal local, regional and national forest cover is defined, a country should be ready to take on a firm emission reduction target, together with liabilities for assuring the permanence of sequestered carbon. Countries should hold buffers according to risks identified nationally and internationally. And while land use planning and inventories are being developed, countries should take on voluntary commitments to afforest, reduce deforestation and enhance sustainable forest management.

"...forestry credits can and need to be considered permanent."

Privately funded project activities need to happen in parallel to work at national level, so as urgently to address local level drivers and introduce tree planting and management systems with long-term viability that give farmers and communities incentives to protect these carbon stocks. This can be achieved through sensitizing and educating them, ensuring participatory planning and designing tree planting systems that bring long-term benefits.

With buffers being held at both project and national levels forestry credits can and need to be considered permanent. Commercial insurance products payable in cash are not a realistic option in the short and medium term to secure forest carbon in developing countries. However, the double buffer approach in a well governed system will provide sufficient liability during the transition phase towards national and sub-national inventories.

verbatim

Danish Climate and Energy Minister Connie Hedegaard

"Now the United States and all other countries have to get concrete about how to deal with the climate challenge until 2020. This will be the litmus test of the commitment. But as Todd Stern said in his speech: The US is glad to be back in the negotiations. For my part I can assure you the delight is mutual."

Zhang Guobao, head of the Chinese National Energy Administration

"We should keep a close watch on the development of cutting-edge (new energy) technologies the world over and invest more to improve research and development capabilities."

UN Secretary-General, Ban Ki-moon at Delhi Summit on Sustainable Development on 5 February 2009

"We should not argue who is more responsible, who is less responsible, who should do more. Climate change is a common, shared responsibility."

Nobel Prize Winner Rajendra Pachauri, the Chairman of the Intergovernmental Panel discussing his campaign to turn Mumbai students into 'green warriors'

"We want to show children what small steps, such as conserving power by switching off the lights and fans, can do."

US Climate Change Envoy Todd Stern, addressing the 2,600 delegates at the March-April climate change talks in Bonn

"The science is clear, the threat is real, the facts on the ground are outstripping the worst-case scenarios. The cost of inaction or inadequate action are unacceptable. America itself cannot provide the solution, but there is no solution without America."

Kenyan Vice-President Kalonzo Musyoka speaking at the East African Health and Scientific Conference in March 2009

"Climate change is not only an environmental issue, but clearly a development issue with a direct bearing on poverty reduction, food security, economic growth, health, human rights, governance and equity."

Indian students from Lok Sabha province in a letter to political parties and top leaders on March 6

"We are aware that climate change will have a severe impact on future generations. To keep this world liveable, it is extremely important that we start using green energy sources like solar energy, wind energy, biomass etc and stop wastage of water and electricity."

Marie-Antoinette Alexis, Mayor of Victoria, Seychelles at a Mayor's meeting on climate change at UN-HABITAT on 26 February 2009

"All countries must work together to combat climate change. In the Seychelles, our 116 islands are on the front line. We can lose our beaches, our tourism, our land and our way of life, if something is not done quickly."

Dr Anthony Patt, International Institute for Applied Systems Analysis commenting on the possibility that solar panels in the Sahara could power all of Europe

"North Africa could supply Europe all the energy it needs...the sun is very strong there and it's very reliable."

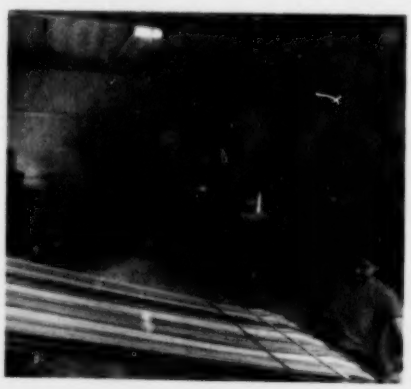
Green Light

Some say that renewable technologies are too expensive and high tech for rural people in developing countries. That is a myth. Renewable energy is a viable option for them, and they can be reached through a market-based model.

Access to efficient energy is one of the major obstacles to their social and economic development. More than 80 per cent of them depend on primitive energy sources, which limit their opportunities, endanger their health though indoor pollution, and create environmental hazards. I have long felt a moral responsibility to create alternatives for them. Grameen Shakti – which I founded and serve as Managing Director – has already installed more than 200,000 Solar Home Systems (SHS) in Bangladesh. It has shown that solar energy applications can be scaled up massively and rapidly to provide affordable and climate-friendly energy for rural people.
We started in 1996, installing a few hundred systems a year, now we are doing over 8,000 a month. We had a target of a million systems by 2015, we now expect to pass that in 2010.
I now dream of empowering 75 million people through renewable energy technologies in just six years. We have set our own Millennium Development Goal – reaching half the people of the country by 2015.

DIPAL CHANDRA BARUA

The current winner of the Zayed Future Energy Prize, is Founding Managing Director of Grameen Shakti, and Deputy Managing Director of the Grameen Bank



Bangladesh is rich in sunshine so our first initiative was to popularize solar photovoltaic technology.
By owning a SHS, a rural family can enjoy bright lights, televisions and radios – and power their mobile phones. The upfront expense is high, but once this is paid off, there are no additional costs or ever-increasing electricity bills. It makes a huge difference to the quality of life, and to income generation.
More than 6,000 biogas plants and 30,000 improved cooking stoves have also been installed. Biogas technology is very appropriate for rural areas because it converts cow dung or poultry droppings into cooking gas, light, and slurry, a good organic fertilizer.

Larger biogas plants can also produce electricity. The stoves protect mothers and children from indoor air pollution, a major killer in developing countries.

There were huge challenges to SHS,

the first was to build a rural network. We worked with local and international engineering institutions to recruit and train engineers who are deployed all over Bangladesh. We also trained local technicians and users, providing jobs, community support and efficient low-cost aftersales service. We initiated scholarship programs for schoolchildren, taught them about renewable energy technologies and trained rural housewives on how to take care of their SHSs.

The second challenge was to develop a suitable financial and technical package for rural people. Drawing on the Grameen Bank's experience, we introduced an installment-based payment, which reduced the upfront cost of a SHS, making it as cheap as kerosene. Our engineers make monthly visits to check on the systems for two to three years and offer their services for a small fee thereafter.

The systems soon came to sell themselves as villagers became aware of their multiple benefits. Increased sales and local production reduced costs, enabling Grameen Shakti to achieve economies of scale and break even in 2002.

We have also successfully laid the foundation for expanding biogas and improved cooking stove programmes. We focused on strict quality control in constructing biogas plants, together with onsite technical assistance and free after sales service – and trained local masons and the plants' owners – creating a huge demand. And we trained over a thousand local technicians to make and repair improved stoves, setting up 36 rural manufacturing units, our staff maintains quality control.

Thousands of happy clients are our greatest promoters and Shakti is becoming a household name in rural Bangladesh. More than two million rural people have benefited from our programmes. Solar electric light enables children to study longer and better and improves health facilities while solar-powered mobile phones have made communication easier. SHSs are helping small rural businesses to stay open late at night, increasing their income, while rural

shops are installing solar-powered mobile phones and televisions to attract more customers.

Biogas technology is paving the way to a green economy and transforming waste into wealth. It is helping rural farmers with few livestock to reduce their fuel costs, enjoy bright light and produce organic fertilizers. Larger sized biogas plant owners are making extra income through giving connections to neighbours, and many are also producing electricity.

Besides being one of the cheapest ways of protect women and children against indoor air pollution, improved stoves reduce wood use by about 50 per cent, saving both time and money. They help rural families to increase savings and capital, protect their health and save the environment at the same time. No wonder interest is growing – we are now making twice as many as last year. We are creating skilled jobs for women, right in their villages. And we are training more and more local young people as solar and stove technicians and biogas plant masons. We plan to create 100,000 green jobs by 2015 and develop entrepreneurs who will promote and install renewable energy technologies, while we provide financial and technical support.

I want to transform Bangladesh and make it a positive example of what a developing country can do in response to the threat of climate change, through applying renewable energy technologies – and to create a green economy for millions of Bangladeshis who will be affected by global warming in the next decade.

We have a successful model in place. It is replacing kerosene, reducing the felling of trees, boosting agriculture, and livestock, promoting organic fertilizers and creating green jobs and income. The SHSs we have installed are already reducing Bangladesh's carbon emissions by 100,000 tons a year.

My personal Millennium Development Goals include installing 7.5 million SHSs and constructing two million biogas plants as well as creating those 100, 000 green jobs. Even achieving only half of these goals would be a source of hope all over the world.

people

2009 UNEP Champions of the Earth

ERIK SOLHEIM
Policy Leadership

With two cabinet posts under his stewardship, Norway's Minister of Environment and Minister of Development Erik Solheim is putting the environment at the forefront of European politics. As a strong advocate of the integral relationship between environment and development, he has been a key supporter of environmental actions at national and global levels throughout his political career. Solheim spearheaded the early implementation of REDD - Reducing Emissions from Deforestation and Degradation - with a grant of US$ 500 million annually. He also paved the way for Norway's membership in UNEP's Climate Neutral Network, catalyzing his country's action towards a low carbon society.

RON GONEN
Entrepreneurial Vision

Recycling mogul Ron Gonen saw opportunity in a very unusual place - trash. The environmental entrepreneur's brainchild, RecycleBank, is an environmental rewards and loyalty company that helps people turn their recyclable garbage into cash. Under RecycleBank's scheme, families that recycle earn points which they can redeem for essentials at over 1,400 local and national retailers. Since its launch in 2004, the initiative has been an unqualified success, expanding into 18 states across the US. Increase in recycling rates to as high as 90 per cent have been recorded in some neighborhoods. And RecycleBank has been very well received by the private sector - Gonen's company attracted a $2 million investment from Coca-Cola as part of the beverage giant's effort to promote recycling. In Gonens own words, "The core of RecycleBank is the ability to target and market to a captive audience that feels good about what they are doing"

KEVIN CONRAD
Policy Leadership

"We seek your leadership, but if for some reason you are not willing to lead, leave it to the rest of us. Please get out of the way." Kevin Conrad's words to the United States delegation - which was one of the key hold-outs on plans for a post 2012 treaty - are widely remembered as a key pivotal moment of the 2007 Bali climate change talks. Significantly, the resulting Bali Action Plan was the first time the role of tropical forests and deforestation in tackling global warming was officially recognized. Now as Executive Director of the Coalition of Rainforest Nations, Conrad is campaigning to better align market incentives with the sustainable use and management of tropical forests. Things are starting to move - the UN recently established the UN-REDD programme, which aims to help developing nations fight deforestation and receive funds through the sale of tradable carbon credits. Meanwhile, Norway is now putting serious money into fighting deforestation, pledging $1 billion for Brazil's Amazon protection fund through 2015. These are just some of the initiatives that are currently mobilizing some of the largest sums in history to support rainforest conservation. Conrad, who is from Papua New Guinea, continues to campaign tirelessly to find ways for the international community to provide incentives for conserving rainforests.

JANINE BENYUS
Science and Innovation

Janine Benyus, a pioneer and champion of the biomimicry movement, is at the helm of the eco-design revolution. Her 1997 book Biomimicry: Innovation Inspired by Nature inverts the way we all think about design, advocating that we draw design inspirations from nature's wisdom and adopt nature's processes to solve some of our challenges. As the President of the Biomimicry Institute in Montana, Benyus has been consulting with sustainable business, academic and government leaders on what we can learn from nature's genius. The key idea is to draw inspiration from nature's clever designs and treat nature as model and mentor, cherished as a teacher - not as a mine to be stripped of its resources.

TENA KEBENA
Next-Generation Champions

The Next-Generation Champions category was created to celebrate the new generation of dynamic, passionate individuals and organizations around the world who are making a real difference for the environment. There could be few more inspiring examples of this than Tena Kebena, an organization in Ethiopia that brings together around 80 children and youth, many of whom have been orphaned by the HIV/AIDS pandemic. The group cleans up and rehabilitates garbage dumpsites around the city of Addis Ababa through reforestation, turning mountains of trash into hills green with trees, herbs and flowers. The sites are also used for urban agriculture – on what used to be a waste pile, the young gardeners are churning out lush rows of vegetables through organic methods and waste water collection. And in this beautifully sustainable cycle, agricultural produce and herbal medicines grown from the urban farm are sold to provide funding for the project and for the children's learning activities.

TULSI TANTI
Entrepreneurial Vision

Tulsi Tanti is the Chairman and Managing Director of Suzlon Energy, the fifth largest wind turbine manufacturer in the world and the largest in Asia. Widely referred to as India's "Wind Man," Tanti is credited for advocating to fellow industrialists, the environmental and economic advantages of staying off the power grid. The company was a true precursor, exploring wind energy in the late 1990s as an alternative to costly and erratic electricity supply to its textile business. Realizing that wind was not just the answer to Suzlon's energy needs but could also fuel the growth of other industries, the company sold off its textile manufacturing and entered the relatively new field of wind turbine generators. With the price of oil recently hitting an unprecedented high, Tanti believes that wind is the energy of the future and Suzlon intends to help launch this industry into the mainstream. "Yes, green business is good business," says Tanti. "But it's not just about making money. It's about being responsible." Suzlon's main factory in the southeastern Indian city of Pondicherry runs exclusively on wind power and collects rainwater to tend to its grounds.

YANN ARTHUS-BERTRAND
Inspiration and Action

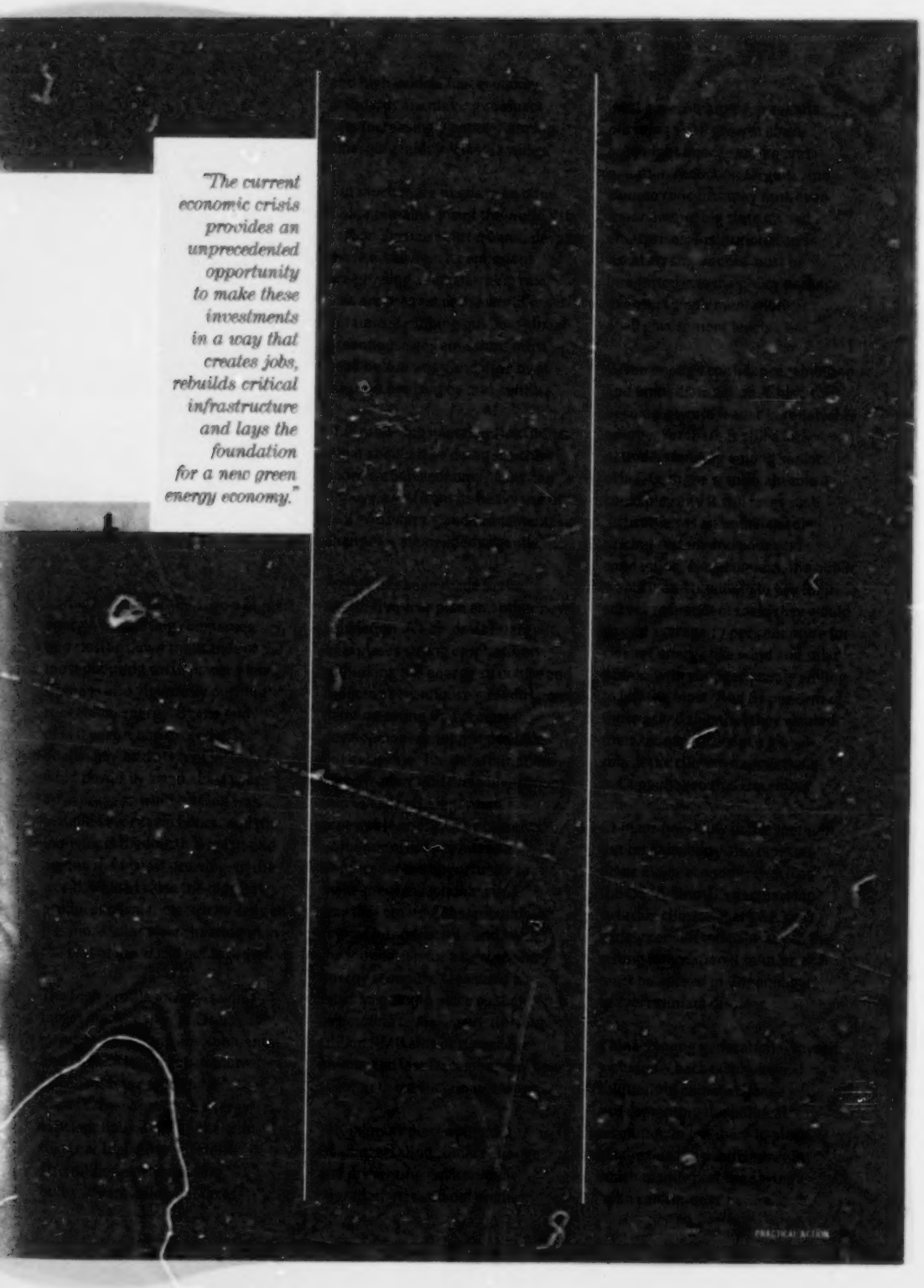
Through his breathtaking aerial photographs from the remotest parts of the globe, French photographer Yann Arthus-Bertrand has helped people around the world see our planet in a new light – beautiful, fragile, threatened. His iconic books have moved millions and a public art exhibition the 'Earth From Above', which premiered in Paris in 2000 to unprecedented success, went on to travel to cities around the world. By 2008, over 130 million people on every continent had visited the exhibit. The images are a stark call to action, combining vivid images of the beauty and vulnerability of our planet with detailed captions describing the environmental pressures it is under. In 2005, Arthus-Bertrand formed GoodPlanet.org, an environmental organization whose objective is to educate about sustainable development and urge individuals across every culture and background to think about the future of all of our planet's inhabitants. Through GoodPlanet.org, Arthus-Bertrand worked with the French Ministries of Education and Environment to produce 22 educational posters on sustainable development featuring his aerial photos. The posters were given out for free to every school in France. Arthus-Bertrand is now preparing a feature-length film about our planet which will be distributed around the globe on World Environment Day.

LOW-CARBON CHINA

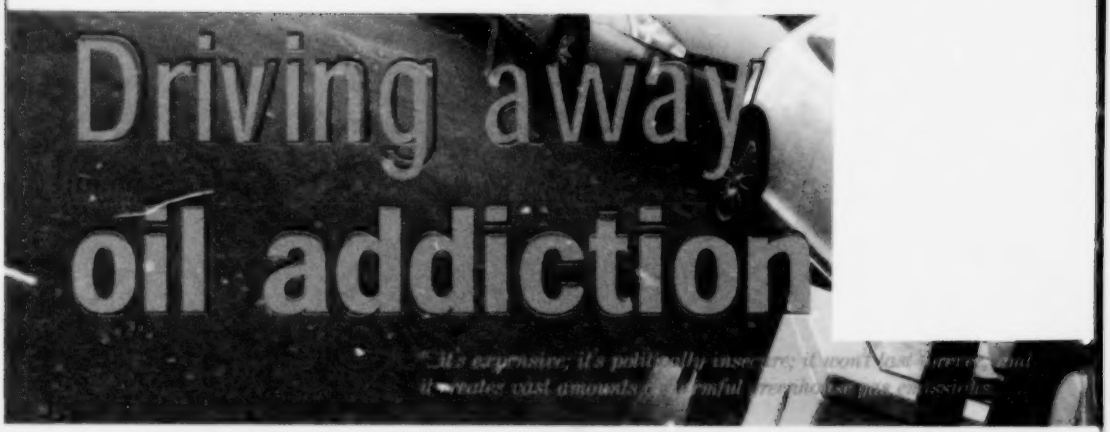
LI YAN

is a climate and energy campaigner for Greenpeace, China

"There are two famous, but curiously contradictory, Chinese sayings about the relationship between people and the natural world, tian ren he yi and ren ding sheng tian – 'nature and man are one' and 'man can conquer nature'. Together, they may provide an insight into how China will grapple with climate change."


"The current economic crisis provides an unprecedented opportunity to make these investments in a way that creates jobs, rebuilds critical infrastructure and lays the foundation for a new green energy economy."

Driving away oil addiction



SHAI AGASSI

is the founder and chief executive of Better Place

"How do you make the world a better place by 2020?"
The question, posed to the group of Young Global Leaders at the World Economic Forum in 2005, spurred me to an entirely new life direction, focused on solving a single problem: how do you run a country without oil? I realised that we had to separate the cars we drive from the petrol that has had such a negative impact on our economy and environment, and to usher in a new era of sustainable transport.

In the current economic climate, environmental interests can appear to be at odds with economic ones. This misalignment is no longer sustainable. We all know the hazards of oil: it's expensive; it's politically insecure; it won't last forever; and it creates vast amounts of harmful greenhouse gas emissions. Yet we continue to fill up our cars.

We are emotionally connected to our cars: we don't like to share them, and we like to drive them fast and far. Yet, while we would not let our kids burn fuel in their bedrooms, we collectively burn up their living room – our planet.

The price of driving cars in our cities is paid in deaths and respiratory disease from smog. The price of extracting and burning fossil fuels from deep in the ground is a change to the Earth's delicate atmosphere which regulates life. We may each be able to afford enough petrol for our cars, but we cannot afford to lose our only planet.

What if we take oil out of the equation? Sustainable transport can help the Earth prosper on many levels. By breaking the world's oil addiction we can realign environmental and economic interests and use people's natural motivations and behaviour to help our planet thrive.

"Rising oil prices and environmental degradation have shown that we must change how we fuel transport."

In December, leaders from around the world will meet in Copenhagen to discuss and outline plans for an ambitious strategy to eradicate the threat of global climate change.

Transport innovation must play a critical role. According to the International Energy Agency, transport accounts for nearly a quarter of the world's carbon emissions. Electric vehicles (EVs) present the opportunity not just to minimise, but to eliminate, these completely from personal transport. Transport as a sustainable service – with zero-emission vehicles powered by renewable energy – eliminates oil and carbon from the equation, allowing us to combat the climate crisis without giving up our personal freedom.

Many solutions to transport, economic and environmental problems are piecemeal – disconnected and short term. The hybrid car, for example, is only a stop-gap solution that prolongs our oil addiction, while only slightly reducing its use. Rising oil prices and environmental degradation have shown that we must change how we fuel transport.

Several technologies are jockeying to replace the internal combustion engine. We have studied them all, and decided that the electric drive train is the best. It will transform our cars into vehicles that produce prosperity in harmony with the environment and end oil addiction. So the battery-powered electric vehicle is the centrepiece of the vision of Better Place, the company I launched in 2007.

The opportunity to move to electric transportation is both global (evident throughout the world) and local (cars, regulations, driving patterns and energy usage vary). So Better Place is rolling out its solution on a market-by-market basis, focusing initially on those most conducive to fast EV adoption.

We work with all parts of the transport ecosystem, including automakers, battery suppliers, governments, utilities, energy companies and infrastructure providers. Better Place builds the infrastructure network and services that will enable individuals, businesses and governments confidently to adopt EVs anytime, anywhere. Since our inception, two years ago, Israel, Denmark, Australia, California, Hawaii and Ontario have committed to deploying electric car networks.

"As we decrease our dependency on oil, we create a carbon-free economy that generates new jobs, levels the global playing field, and creates sustainable and environmentally beneficial growth for future generations."

Simply put, we buy batteries and renewable electricity and sell miles – while developing infrastructure that makes EVs convenient, affordable and appealing.

Better Place connects clean energy sources, through the existing electricity grid, with car batteries – providing drivers with an alternative to burning gasoline. Doing this on a scale that can move an entire country is to create a virtual oil field – one that will never run dry and will not kill us in the process.

The infrastructure includes hundreds of thousands of charge spots per region, in private homes, workplaces and public places. These are supplemented by a network of battery switch stations that will allow drivers to swap a depleted battery for a full one, in less time than it takes to fill a tank with petrol, thus removing the main perceived EV constraints of long battery recharge time and limited driving range.

Better Place will own both the fixed infrastructure of this system and the batteries (separating battery ownership from the car). By making the battery an extension of the infrastructure, we can provide consumers with greener and cheaper motoring, making being green affordable for everyone. Software will optimise the use of energy, providing reassurance to the driver, efficiencies to utilities and overall cost effectiveness.

As we decrease our dependency on oil, we create a carbon-free economy that generates new jobs, levels the global playing field, and creates sustainable and environmentally beneficial growth for future generations. We and our worldwide partners – including auto makers, battery manufacturers, energy companies and governments- are making rapid progress. Israel has declared its commitment to be oil free by 2020. Denmark committed to a renewable energy-powered electric car network, presenting new opportunities for its considerable stores of wind energy. Australia decided to reduce its carbon footprint by utilising its robust renewable energy supply. The California Bay Area will be the EV capital of the U.S. And Hawaii has the goal of changing from getting 95 per cent of its energy from imported oil today to meeting 70 per cent of its energy needs from clean energy by 2030. Twenty-five more countries around the world are already talking to Better Place about how to be next.

We believe we are on an accelerated path to something truly amazing: sustainable transport and economic growth that really benefits our planet, and leaves nothing behind – except the addiction to oil.

Your Planet Needs You: Useful Links

This page contains links to websites from governments, international organizations, non-governmental organizations, businesses, media, and other groups from around the world to help you finds information, resources and ways to help the planet. We have compiled these links from our own review of the vast amount of information available on the Internet to help you to find the most relevant sources for your research. Our Planet magazine does not, however, endorse the viewpoints of any of the groups to which we link, and we cannot guarantee the accuracy of the information posted on these sites. Rather, we hope to provide you with a broad range of opinions and perspectives.

www.unep.org/unite
UNEP is a partner in UNite to Combat Climate Change, the United Nations campaign to encourage civil society and communities around the world to unite and act now to combat climate change.

www.unep.org/billiontreecampaign
An unprecedented worldwide tree planting initiative, Plant for the Planet: The Billion Tree Campaign has the ambitious goal of planting seven billion trees – one for every person on the planet – by the end of 2009.

www.unep.org/climateneutral
The Climate Neutral Network (CN net) is an initiative led by UNEP to promote global action and involvement in moving towards low carbon economies and societies.

www.cleanuptheworld.org
Supported by UNEP, Clean Up The World Weekend each year inspires an estimated 35 million volunteers from more than 120 countries to clean up and conserve their local environment. In 2009, the event takes place on 18-20 September.

www.unep.org/publications/ebooks/kick-the-habit
Available online, Kick the Habit is a UN Guide to Climate Neutrality for governments, organizations large and small, businesses and individuals who want to embark on the path to climate neutrality.

www.climatechange.eu.com
The European Commission's 'You Control Climate Change' campaign website provides information about climate change in 21 languages, including tips for how individuals can help bring it under control.

www.chinadialogue.net
This bilingual source of news, analysis and discussion on all environmental issues with a special focus on China is the brainchild of chinadialogue.net, an independent non-profit organization.

www.yourplanetneedsyou.org
One of a rapidly growing number of community-based sites, Your Planet Needs You exists to inspire and support people who want to live more sustainably.

http://survival.scienceof.com
A children's site, 'The Science of Survival: Your Planet Needs You' includes interactive, educational games based around the theme of survival on a changing planet.

www.globalactionplan.org.uk
A UK environmental charity, Global Action Plan helps households, workplaces, schools and the wider community to reduce their carbon footprint.

www.unwto.org/climate/index.php
The World Tourism Organization's climate change and tourism site.

www.climateark.org
This climate change and global warming portal contains links to climate change news feeds, a blog and social network.

www.guardian.co.uk/environment/network
This informative portal gathers websites from around the world focused on environmental topics.

www.conservation.org/act/live_green/Pages/default.aspx
Conservation International's website features an innovative carbon calculator and eco-rating quiz.

www.scidev.net/en/climate-change-and-energy
Africa has contributed less than any other region to the greenhouse gas emissions that are widely held responsible for global warming. But the continent is also the most vulnerable to the consequences.

www.saveenergy.vic.gov.au
This Australian government site provides energy saving facts, advice and practical tips, ranging from how to switch to renewable energy to the powerful black balloons advertising campaign.

to Copenhagen

www.sealthedeal2009.org
Seal the Deal! is a powerful global campaign to promote a definitive agreement on climate change when governments gather for the crucial UN climate convention talks in Copenhagen in December 2009.

www.tcktcktck.org
The website of the Time for Climate Justice campaign, which was launched by a formidable coalition of non-governmental organizations calling themselves the Global Campaign for Climate Action.

She so impressed Bill Clinton at a climate change meeting a little less than two years ago that he called her "the most famous person to take the stage today". That was saying something since Shakira was sharing a platform with Larry Page, one of the founders of Google, and the recently retired British Premier Tony Blair – not to speak of the former President himself. But he may have been right. For the award-winning singer famed for her gyrating routine more than for her IQ of 140, has so far sold 60 million albums worldwide, making her Latin America's most popular performer ever.

The multi-Grammy winning star – who just months before had opened the Hamburg concert in the worldwide Live Earth bid to combat global warming – was there on serious business. When she got to the podium at the meeting of the Clinton Global Initiative, she announced a $40 million charitable donation to help poor people recover from natural disasters. Much of it went to cope with the aftermath of Hurricane Felix in Nicaragua. A few months later she was meeting victims of Hurricane Sidr in Bangladesh. "I was devastated to see that entire villages were wiped away," she said. "I will never forget the faces of the mothers who had lost their children."

Shakira has been campaigning – and donating money for – sustainable development since first achieving success at the age of 18. She says it is "as important to me as my musical career" and it certainly goes deep, back to her

"I will never forget the faces of the mothers who had lost their children"

own childhood. Her teachers (who rejected her for the school choir on the grounds that she sang "like a goat") would take her and fellow pupils to help children who were too poor to go to school to learn to read and write. Moved to find them "so hungry that they couldn't concentrate" she vowed that "if ever I found success, I would do something about it." Her resolution was reinforced by seeing glue-sniffing orphans, barefoot and in tattered clothes, living in a park near her home in the northern Colombian city of Barranquilla.

"Children are the most vulnerable population in the world and, at the same time, they are our only hope for a safer world," she believes. Now a UNICEF Goodwill Ambassador, she has focused particularly on campaigning for universal education worldwide, and has lobbied both the US Congress and Gordon Brown, the UK Prime Minister. "Education can actually save lives", she says. "In the developing world, people who are born poor will die poor, and that is because of the lack of opportunities, opportunities that come from education."

She practices what she preaches. In 1995 she set Pies Descalzos "Barefoot" Foundation, named after her first big international hit and the children she had seen in the park, which she initially largely funded personally. It has built special schools for poor children all over Colombia, so far educating some 30,000 of them, and she now plans to replicate this worldwide. Two and a half years ago she and Nobel Prize laureate Gabriel Garcia Marquez, a fellow Colombian, launched Latin America in Solidarity Action to fight child poverty in the continent. Last year she was named Humanitarian of the Year by the magazine People in Espanol and in January she was invited to perform at President Barack Obama's Inauguration celebrations.

She is determined to go on using her fame to press for what needs to be done. "It's using the spotlight that shines on me during a concert and moving it away from me to put it on the issues that need attention," she says. GL

"Children are the most vulnerable population in the world and, at the same time, they are our only hope for a safer world"

UNite to combat
CLIMATE CHANGE
UNEP
www.unep.org/ourplanet